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"Some Phonological Rules in Sioux"

Carol Alyea

SOME PHONOLOGICAL RULES IN SIOUX

Preface: This summer in Area Linguistics we have experimented with the use of context sensitive feature rules, which are to be thought of as operating on morphemes represented by strings of systematic phonemes, each of which is an abbreviation for a set of classificatory feature-specifications. I have attempted to summarize some of our findings. The rules which follow are incomplete and probably inaccurate. No attempt has been made to correctly order them. Yet it is hoped that in them we have captured some phonological generalizations about Lakota Sioux. These are the systematic phonemes with which morphemes will be spelled:

p	t	k	ʔ	i	u
pʔ	tʔ	kʔ		ɪ	ʊ
px	tx	kx		e	o
	č			a	
	čʔ			ə	
	s š	x			
	sʔ	xʔ			
	z ž	ɣ			
m	n				
	l				
w	y	h			

- I. Open transition between phones with closure and non-syllabic phones, the voicing of the first phone and its release corresponding to that of the second phone

A.

1. $[+ \text{cls}] \rightarrow [\text{vd}] / \text{---} \begin{smallmatrix} -\text{syl} \\ +\text{vd} \end{smallmatrix}$
2. $\emptyset \rightarrow \begin{smallmatrix} -\text{syl} \\ +\text{voc} \\ +\text{vd} \end{smallmatrix} / \text{---} \begin{smallmatrix} -\text{syl} \\ +\text{vd} \end{smallmatrix}$

B. Examples of voiced transition

1. $k \rightarrow g^{\ominus} / \text{---} \begin{smallmatrix} m, n, l, w \end{smallmatrix}$
 - a. $/i'kmu/ [ig^{\ominus}mu]$ 'cat'
 - b. $/\text{ču'wiknaka}/ [\text{ču'wig}^{\ominus}naka]$ 'dress'
 - c. $/\text{'okle}/ [\text{'og}^{\ominus}le]$ 'shirt'
 - d. $/\text{štak'waya}/ [\text{št}g^{\ominus}\text{'waya}]$ 'parboil' (corn)
2. $p \rightarrow b^{\ominus} / \text{---} l$
 $/plo/ [b^{\ominus}lo]$ 'potato'
3. $m \rightarrow m^{\ominus} / \text{---} n$
 $/mni/ [m^{\ominus}ni]$ 'water'
4. $x' \rightarrow x^{\ominus} / \text{---} m$
 $/xmi/ [x^{\ominus}mi]$ 'crooked'
5. I have no examples of $t \rightarrow d^{\ominus}$
6. Phonetically we find $[mp]$, $[nč]$, $[ŋk]$, with no open transition between the closure and non-syllabic phone. This is because phonemically the nasal is not there. (See III)
7. Should anyone doubt that $g^{\ominus}$ results from k (and not kh or kx , with which it is in complementary distribution), observe the compound word for coyote:
 $/\text{šuk'manitu}/ [\text{š}uŋ(g^{\ominus})\text{'manitu}]$, literally 'dog-prairies', from $/\text{šuka}/$ 'dog' and $/\text{'manitu}/$ 'prairies.' I am uncertain whether the $g^{\ominus}$ is lost. Perhaps the sequential constraint against $*ccc$ causes the $g^{\ominus}$ to be suppressed ($*ŋg^{\ominus}m$). Note that the a of 'dog' is lost. A rule of compounding should be written to account for this regularly-occurring phenomenon.

C. Examples of voiceless transition

1. $k \rightarrow k^h$ /___p, pʔ, t, č
 - a. /na'kpa/ [nakh'pa] 'ear'
 - b. /i'kpakp'i/ [ikh'pakhpʔi] 'hatch'
 - c. /i'ktomi/ [ikh'tomi] 'spider'
 - d. /kčiza/ ['khčiza] 'fight'
2. $t \rightarrow th$ /___k /'witka/ ['withkə] 'egg'
3. $p \rightarrow p^h$ /___t /'zapta/ ['zaphta] 'five'

II. Uvularized stops do not have uvular friction before high vowels.

A. We will say that tx, px, kx, have the feature +hsp, 'heightened sub-glottal friction.' As the body of the tongue moves up and forward to anticipate a high vowel, the uvular friction is lost, but the hsp remains, acoustically indistinguishable from aspiration.

B. $\begin{bmatrix} -hi \\ +hsp \end{bmatrix} \rightarrow [+hi] / \text{---} \begin{bmatrix} +syl \\ +hi \end{bmatrix}$

C. Examples

1. $kx \rightarrow kh$ /___u /'kxuwa/ ['khuwa] 'chase'
2. $kx \rightarrow kh$ /___i /ma'kxinapte/ [ma'khinaphte] 'shovel'
3. $tx \rightarrow th$ /___i /'txipsila/ ['thĩpsila] 'turnip'

III. Stops are pre-nasalized following a nasal vocoid

A. $\emptyset \rightarrow \begin{bmatrix} +nas \\ \alpha cor \\ \beta bek \end{bmatrix} / \begin{bmatrix} +voc \\ +nas \end{bmatrix} \text{---} \begin{bmatrix} +cls \\ \alpha cor \\ \beta bek \end{bmatrix}$

B. Examples

1. $\emptyset \rightarrow m$ /v___p /a'sapi/[a'sampi] 'milk'
 2. $\emptyset \rightarrow n$ /v___č /wi'čĩčula/[wi'čĩnčula] 'girl'
 3. $\emptyset \rightarrow ɲ$ /v___k(x) /šuka/[šũnka] 'dog'
- /wačĩwakxo/[wačĩwakxo] 'I pouted'
- /wačĩkxo/[wačĩɣkxo] 'he pouted'

IV. Final vowels have a breathless release at the end of a discourse (before breath)

A. [+voc] → [-vd] /___# Actually, this rule distorts the reality since the vowel does not become completely voiceless, but has a voiceless release.

B. /čuka / [čʉkaA]

V. Vowel variation between tense/lax in unstressed syllables

A. [+voc] → [~~lax~~] /-stress (opt.)

B. Actually, neither tense/lax nor open/close adequately differentiate i/ɨ and a/ə since both a and ə might be considered open and lax. What happens is a shift toward neutral position in unstressed syllables. I am of the opinion that the probabilities of this occurring are higher when the surrounding sounds are articulated in another corner of the vowel triangle.

C. /'iya/ ['ɨyə] 'rock'; /wa'kmiza/[wag^ə'mizə] 'corn'

In the above unstressed syllables the high vowel may have an influence on the a, raising it. Likewise, i → ɨ in the environment of low vowels. /hi'hana+ki+a'ke/ [hi'hana+kɨ+a'ke] 'morning-the-again.'

However, the lack of stress is the more important factor.

VI. In rapid speech low vowels may assimilate to a following high vowel.

A. $\begin{bmatrix} +\text{voc} \\ +\text{low} \end{bmatrix} \rightarrow [-\text{lo}] / ______ [-\text{syl}] \begin{bmatrix} +\text{voc} \\ +\text{hi} \end{bmatrix}$ (opt.)

B. Examples

1. /wa'kǎlapɨ+e'ta+yə+čɨ+he/ 'Would you like coffee?'
[wa'kxalapɨ+e'ta+yɛ/æ+čɨ+he]

2. /pi'lamayaye/ 'Thank you.'
 [pi'lamayæ]

VII. In a man's speech, the /i/ in the plural marker may be lost, with the /p/ becoming slightly voiced. Thus for /-pi/ 'pl'

- A. 1) [+voc] → ø/___ #
 2) [+cls] → +vd /___ #

B. /wamayəkapi/[wamayəkab] 'They saw me.'

VIII. Lengthened vowels

- A. [+voo] → [+:]/ emphasis on stressed syllable
 ['li:la] 'very' used in 'very beautiful'
 B. Another conditioning factor is contraction, where one vowel is suppressed and the other lengthened.
 /wowači/[wa:či] 'I dance'

IX. Vowel deletion

- A. There seems to be a constraint that when two vowels are contiguous, one is deleted. v → ø/v
 B. /ma+u/[mɤ] 'I used' (a hammer)

X. Stress, syllable breaks, and affixing

- A. If we are writing stress before the syllable, we need to know where the breaks are. In a quick run-through of utterance initial and final phones, I found:
 1. Initially, vowels, c, and cc (pl, kč, kt, pt, sp, mn, xl, xt, x', šm, sn, št)
 2. Finally, vowels, š, l, ?
 3. My tendency would be to put stress before medial consonant clusters, although phonetically I heard it differently.

a. /'cc/ → [c'c]

b. /wa'kmiza/[wag^ə'mizə]'corn'

B. When prefixes are added to a two-syllable stem, the word stress moves to the second syllable.

'cvcv, --> cv'cv(cv)_n cvcv

XI. Residual problems for which I have not written feature rules

A. Vowel Alteration

1. a. a → e /___šni

b. Example: /wa'kaga/[wa'kaga] 'I made'

[wa'kagešni] 'I didn't make'

2. a. e → a /___he

b. Examples: /i'štime+he/[i'štima+he] 'Did he sleep?'

/slol'waye+he/[slol'wayahe] 'Did I know?'

B. Nasalization

1. As yet I have not been able to predict the nasalization and vowel change that may occur before /-kte/ 'future'

2. Example: /i'kloniča/[ig^əloniča] 'stubborn'

but [ig^ə'loničip+k^hte] 'will be stubborn'

C. Stem initial k becomes č when preceded by i.

k - č /i___